MARINE SHEET METAL VENTILATION

SHOP DRAWINGS AND BLUEPRINT READING

A WORKBOOK

NAME OF TRAINEE_____

ADDRESS_____

_____

SCHOOL_____

INSTRUCTOR_____

INSTRUCTOR'S COMMENTS_____

_____

See also Supplement

Bulletin 347

Commonwealth of Pennsylvania
DEPARTMENT OF PUBLIC INSTRUCTION
Harrisburg
1942

MARINE SHEET METAL VENTILATION

SHOP DRAWINGS AND BLUEPRINT READING

(A Workbook for Pre-Employment and Supplementary Training)

Bulletin 347

Prepared by

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF PUBLIC INSTRUCTION
DIVISION OF INDUSTRIAL EDUCATION

in Cooperation With

SCHOOL DISTRICT OF PHILADELPHIA

SHIPBUILDING YARDS IN THE PHILADELPHIA AREA

and

UNITED STATES OFFICE OF EDUCATION
FEDERAL SECURITY AGENCY

Commonwealth of Pennsylvania
DEPARTMENT OF PUBLIC INSTRUCTION
Harrisburg
1942

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Washington, D. C.

Vocational Education
for
National Defense

FOREWORD

THIS workbook is one of a series of units of instruction prepared expressly for use in training marine sheet metal workers. In that the shop drawings portray typical ventilation shapes which are fabricated in marine sheet metal shops and the installation of these shapes aboard ship, these assignments are applicable to both shop and field instruction in blueprint reading.

Although the drawings follow closely naval-type construction specifications, with slight modifications they may be employed in training shop and field sheet metal workers for cargo and tanker work. The blueprint reading ability required in the two types of marine construction is similar, although exact construction specifications may differ materially.

Appreciation is extended to the draftsmen, foremen, mechanics, and instructors who assisted in the preparation and criticism of these drawings and accompanying work assignments.

Acknowledgment is made to Mr. Charles F. Bauder, Director of Vocational Education, and to Mr. William E. Brunton, Assistant Director in charge of Defense Training, of the School District of Philadelphia, for cooperation and assistance in the development of this material. Special acknowledgment is extended to marine sheet metal instructors of the Mastbaum Vocational School and Annex for their assistance in preparing these drawings.

This workbook was prepared by the Philadelphia Field Curriculum Laboratory of the Pennsylvania Department of Public Instruction, under the direction of Charles F. Zinn, Adviser, Division of Industrial Education. This unit was completed under the general supervision of Paul L. Cressman, Director, Bureau of Instruction, and Urwin Rowntree, Chief, Division of Industrial Education.

FRANCIS B. HAAS
Superintendent of Public Instruction

March 1942

SUGGESTED APPLICATIONS OF THIS WORKBOOK

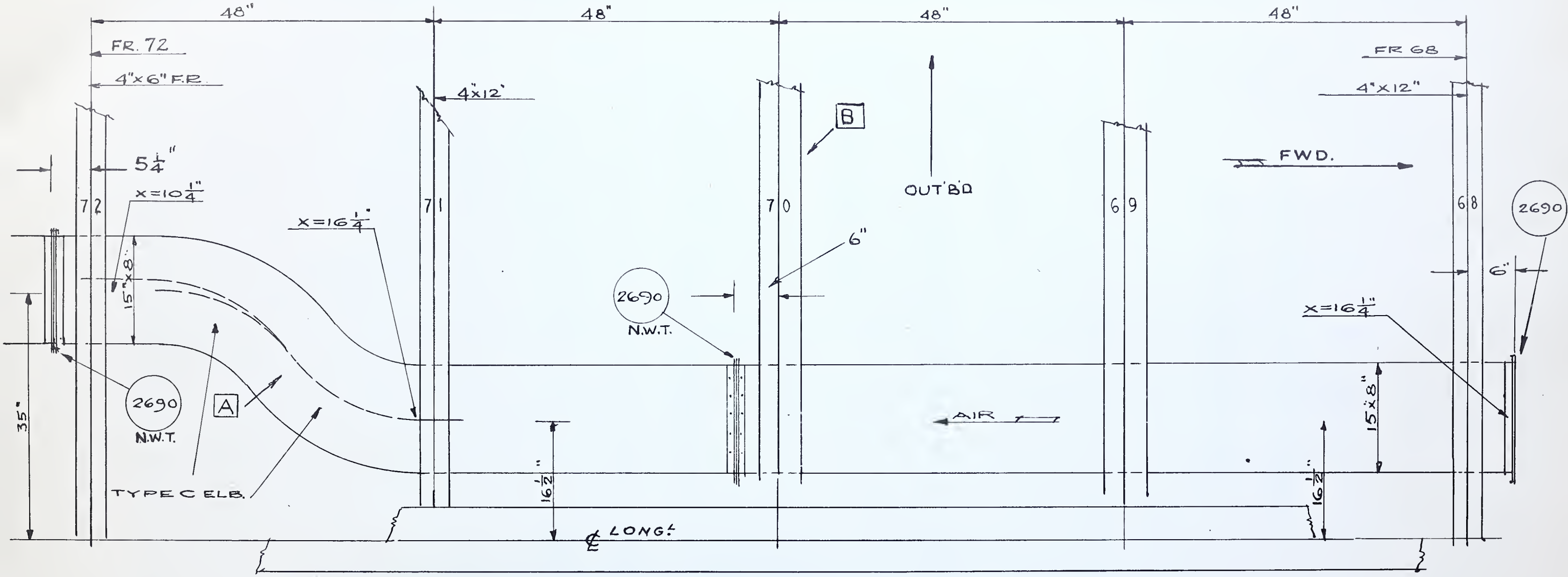
1. In teaching blueprint reading associated with marine sheet metal shop fabrication on a pre-employment or supplementary basis.

2. In teaching blueprint reading associated with marine sheet metal "field" work (aboard ship) on a pre-employment or supplementary basis.

3. In illustrating applications of shapes fabricated as a part of the suggested unit course, "Marine Sheet Metal Practice — Part I, Ventilation" (published separately).

4. As a source of practical layout problems in teaching marine sheet metal pattern development on a supplementary basis.

5. In teaching the location of sheet metal installations aboard ship.



UPPER DK
PORT SIDE FR 68-72.

SCALE ¾" = 1'—0"

1.

CUT HERE TO REMOVE SHEET

NAME OF TRAINEE_____ INSTRUCTOR_____ DATE_____ SCHOOL_____ GRADE_____

Marine Sheet Metal Ventilation

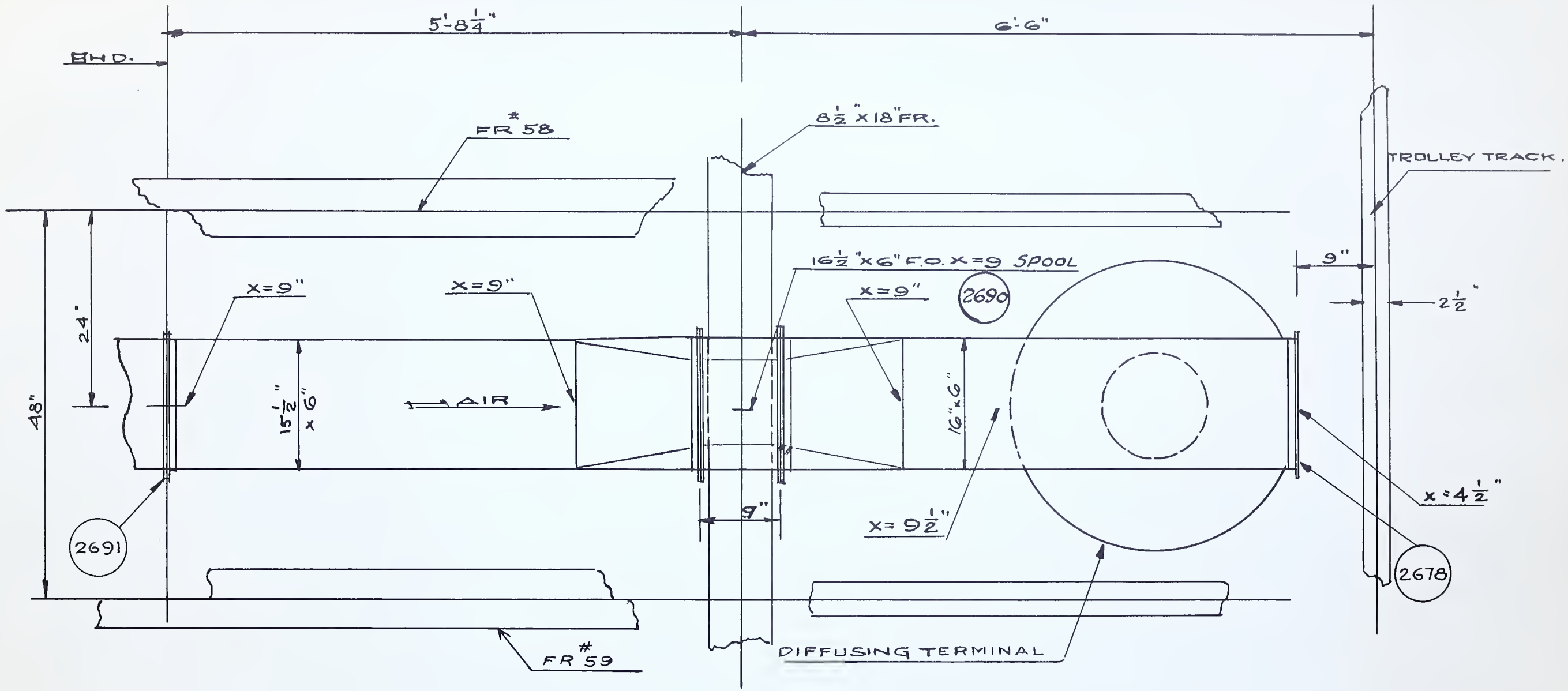
Assignment Sheet, Shop Drawing No. 1

UPPER DECK, PORT SIDE—FR. 68-72

DIRECTIONS: Read each question, locate the answer on drawing No. 1 and then record the answer to the right of each question.

QUESTIONS	ANSWERS
1. What frames are included on drawing No. 1?	
2. What is the size and shape of the duct?	
3. What is the elevation of the duct aft of Fr. 68?	
4. What is the elevation of the duct at Fr. 71?	
5. What is the elevation of the duct at Fr. 72?	
6. What is the rise of type "C" elbow?	
7. What is the member "B" called?	
8. State the distance from ¢ of duct to ¢ longitudinal.	
9. State the distance from face of N.W.T. flange to ¢ of Fr. 72.	
10. State the distance from ¢ of duct to longitudinal at Fr. 72.	
11. What is the dimension of Fr. 72?	
12. What is the dimension of Fr. 68?	
13. What is the offset in elbow "A"?	
14. What kind of flange is 2690?	
15. What is the width between the frames?	
16. What direction do the frames run?	
17. What direction does the air flow?	
18. What is the overall dimension of duct shown on this sketch?	

NOTES



SCALE $\frac{3}{4}$" = 1'-0"

UPPER DECK
STARB'D SIDE FR 58-59.

2

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NAME OF TRAINEE_____ INSTRUCTOR_____ DATE_____ SCHOOL_____ GRADE_____

Marine Sheet Metal Ventilation

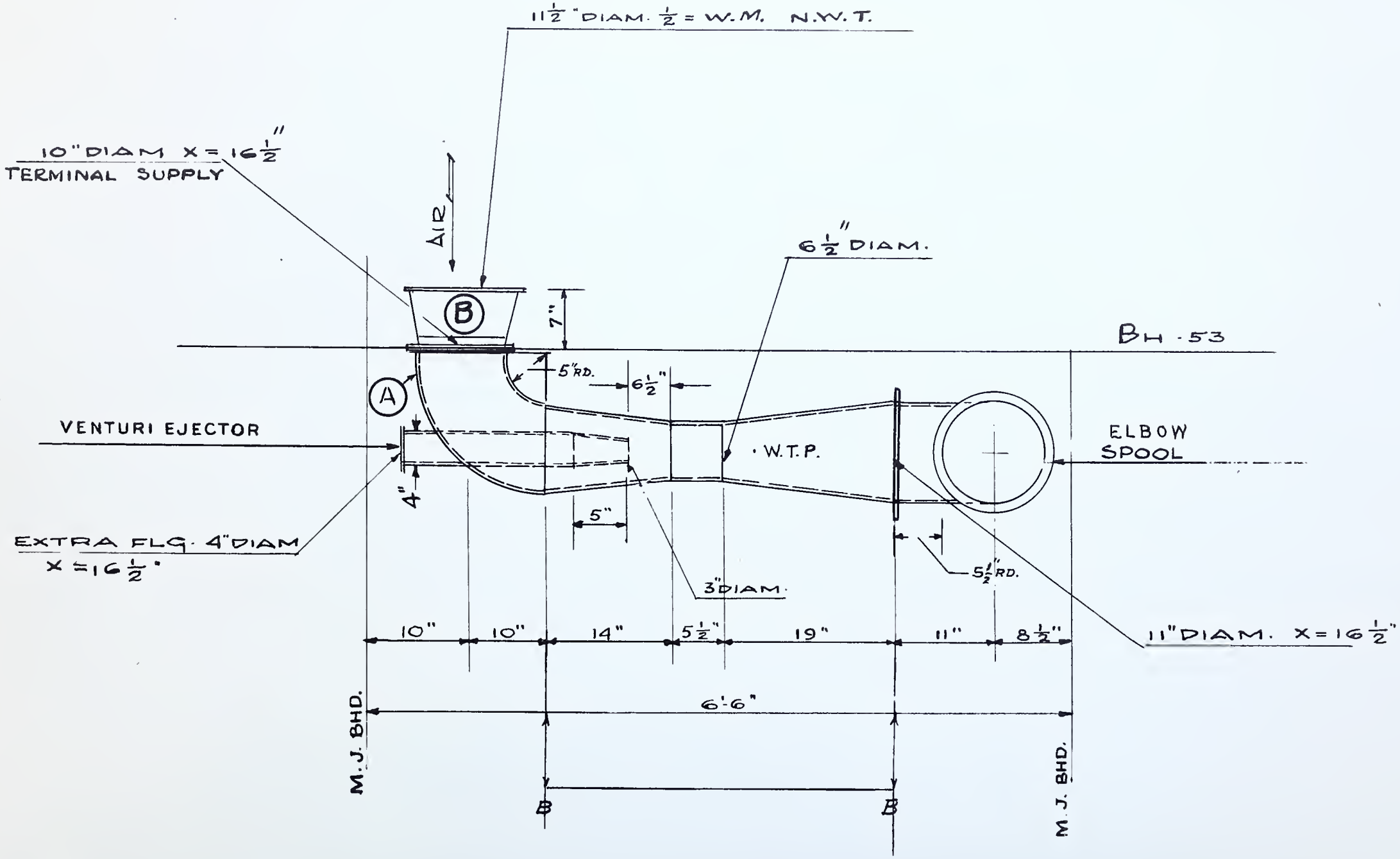
Assignment Sheet, Shop Drawing No. 2

UPPER DECK, STARBOARD SIDE—FR. 58-59

DIRECTIONS: Read each question, locate the answer on drawing No. 2 and then record the answer to the right of each question.

QUESTIONS	ANSWERS
1. State the length of the spool shown on drawing No. 2.	
2. State the dimensions of the spool.	
3. What is the elevation of the spool?	
4. What is the meaning of the abbreviation F. O.?	
5. State the elevation of flange 2678.	
6. What is ℄ distance from flange 2678 to trolley track?	
7. State the ℄ distance from Fr. 58 to Fr. 59.	
8. State the ℄ distance from Fr. 58 to oval.	
9. State length of duct from flange 2678 to flange 2690.	
10. State length of duct from flange 2691 to flange 2690.	
11. State the direction of air flow.	
12. What item determines whether the system is supply or exhaust?	
13. State the dimensions of the rectangular ducts.	
14. What type flange connects to item 2690?	
15. What are the size of transformers?	

NOTES



SUPERSTRUCTURE DK
PORT - FR 52 - 54.

SCALE ¾" = 1'-0"

3

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NAME OF TRAINEE_____ INSTRUCTOR_____ DATE_____ SCHOOL_____ GRADE_____

Marine Sheet Metal Ventilation

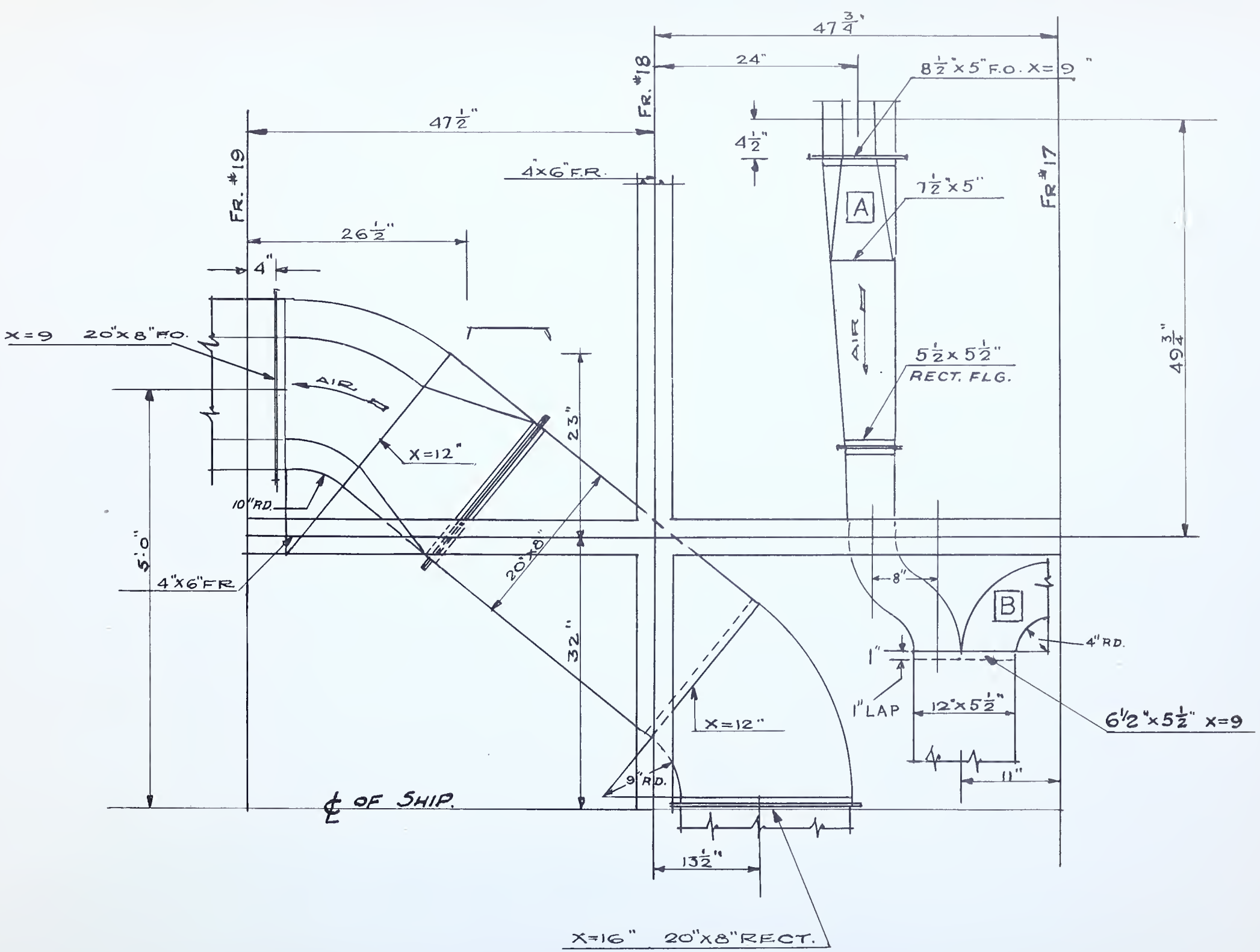
Assignment Sheet, Shop Drawing No. 3

SUPERSTRUCTURE DECK, PORT — FR. 52-54

DIRECTIONS: Read each question, locate the answer on drawing No. 3 and then record the answer to the right of each question.

QUESTIONS	ANSWERS
1. What is the scale of drawing No. 3?	
2. How long is the terminal?	
3. What is the diameter of the terminal "B"?	
4. State the elevation of the terminal "B".	
5. In water-tight work, what type joint should be made?	
6. What is the elevation of the 4″ venturi ejector?	
7. What is the elevation of the 11″ diameter flange?	
8. State the distance from the ℄ of elbow spool to ℄ of intake	
9. What does the solid and dash lines at "A" indicate?	
10. State the length of the fitting "B-B".	
11. State the throat radius of elbow "A".	
12. What is the meaning of the abbreviation, "½ = W.M."?	
13. State the location of this layout.	
14. What type of flange is specified for Bh'd 53?	
15. What is the dimension between metal joiner Bh'd?	
16. What is the ℄ distance from Bh'd 53 to ℄ of 6½″ diameter, assuming that elbow "A" has 1″ straight from radius point to ℄ of Bh'd 53?	

NOTES



SCALE $\frac{3}{4}$"=1'-0"

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Marine Sheet Metal Ventilation

Assignment Sheet, Shop Drawing No. 4

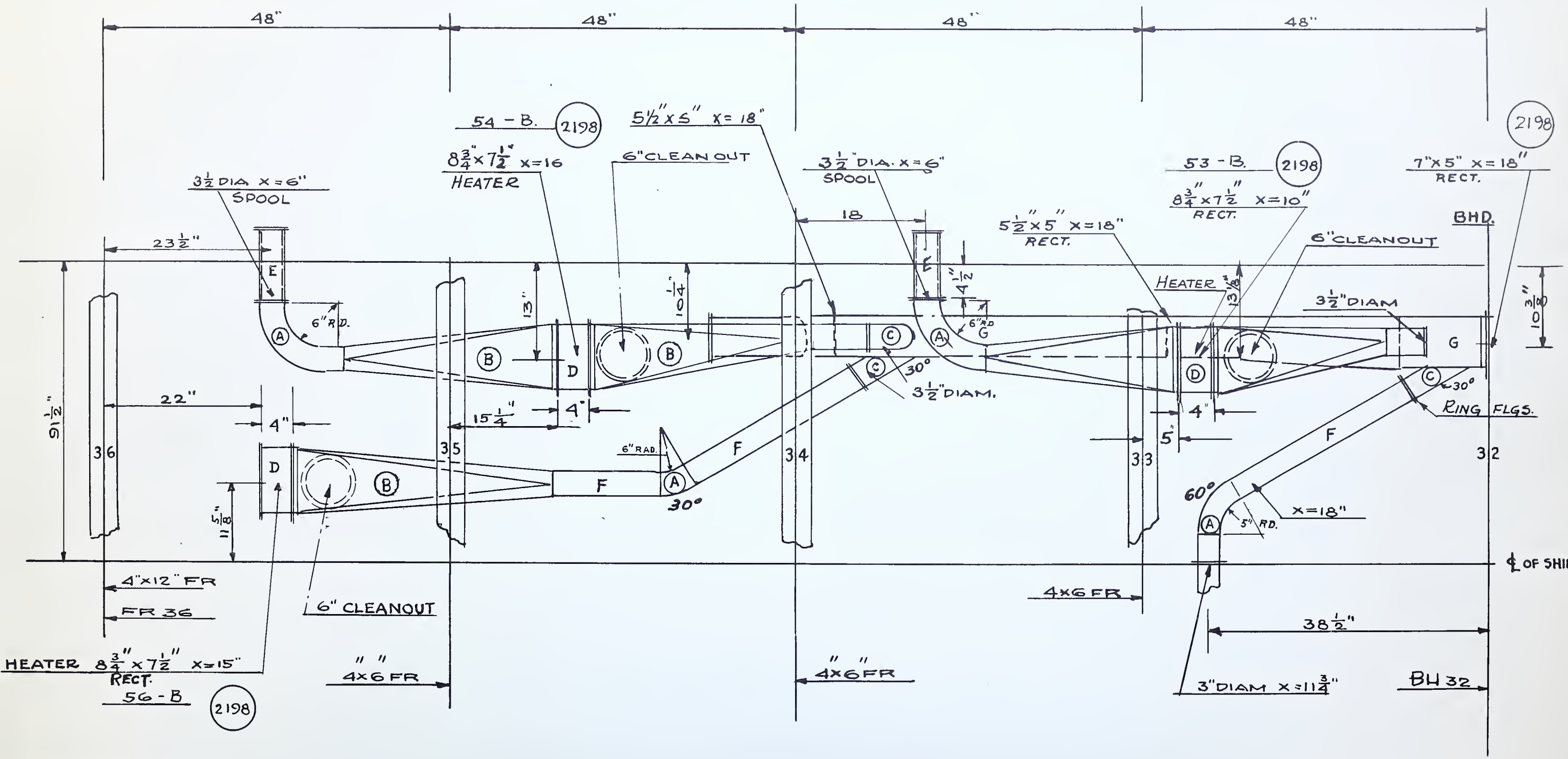
PORT SIDE — FR. 17-19

DIRECTIONS: Read each question, locate the answer on drawing No. 4 and then record the answer to the right of each question.

QUESTIONS	ANSWERS
1. What is the location of duct shown on this drawing?	
2. What is the direction of air through section "A"?	
3. State the ℄ distance from 8½" x 5" F.O. to Fr. 17.	
4. State the ℄ distance from 5½" x 5½" duct to ℄ of Fr. 19.	
5. Give sizes of shapes at the split fitting.	
6. State the distance from ℄ of ship to 8½" x 5" F.O. flange.	
7. What is the heel radius of fitting "B"?	
8. State "A" distance from underside of deck to top of 20" x 8" rectangular duct at the extra flange location.	

QUESTIONS	ANSWERS
9. State distance between top of 20" x 8" rectangular duct and underside of Fr. 18.	
10. Give the rise of 20" x 8" rectangular elbow.	
11. Give the rise of 20" x 8" F.O. elbow.	
12. Give direction of air flow in 20" x 8" rectangular duct.	
13. State the ℄ distance from 20" x 8" rectangular duct to Fr. 19.	
14. What is the scale of this drawing?	
15. State the distance from Fr. 19 to flange.	

NOTES


48"
48"
48"
48"
54 - B.
2198
8¾"x7½" x=16
HEATER
5½"x5" x=18"
6"CLEAN OUT
3½ DIA x=6"
SPOOL
3½"DIA. x=6"
SPOOL
53 - B.
2198
8¾"x7½" x=10"
RECT.
5½"x5" x=18"
RECT.
7"x5" x=18"
RECT.
2198
BHD.
6"CLEANOUT
HEATER
3½"DIAM
23½"
18
22"
4"
15¼"
4"
13"
10"
6"RAD.
30°
3½"DIAM.
RING FLGS.
60°
x=18"
5" RAD.
38½"
3"DIAM x=11¾"
BH 32
4"x12" FR
FR 36
6" CLEANOUT
4x6 FR
4x6FR
4x6FR
4x6 FR
HEATER 8¾"x7½" x=15"
RECT.
56 - B
2198
SCALE ¾"=1'-0"
5

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NAME OF TRAINEE_____ INSTRUCTOR_____ DATE_____ SCHOOL_____ GRADE_____

Marine Sheet Metal Ventilation

Assignment Sheet, Shop Drawing No. 5

PORT SIDE, UPPER DECK

DIRECTIONS: Below is a list of 13 items shown on drawing No. 5. Read the drawing to determine the number of each item shown and record the answer in the column marked "No. Required."

ITEM No.	DESCRIPTION	No. REQUIRED
1.	3½" diameter 90° — 6" rad. elbow	
2.	3½" diameter 30° — 6" rad. elbow	
3.	3" diameter 60° — 5" rad. elbow	
4.	3" diameter 30° — collar	
5.	3½" diameter 30° — collar	
6.	3½" spools 9" long	
7.	4" x 8¾" x 7½" heaters	
8.	8¾" x 7½" W.T. Flanges	
9.	3½" diameter W.T. Flanges	
10.	3½" diameter N.W.T. to W.T. Flanges	
11.	3½" diameter N.W.T. ring flanges	
12.	3" diameter N.W.T. ring flanges	
13.	6" diameter clean-outs	

NOTES

BH

6"DIA. X=13"

6" RAD.

6"-E-TERM

4½"- E-TERM

4"X12"FR

FR 36

2195

29"

2½"DIA
X=6¼"

X=17 9/16"

X=5½"

X=13¾"

X=13¾"

3½"DIA.

5 1/8"
41⅛"

4"RAD.

X=12¼"

X=12¼"

LONGITUDINAL BULKHEAD

X=7¾"

30°

4"RAD.

11"X11"

9"

11"X12½"

AIR

11"X12½"

9"

22"

X=16"

X=6"

42"

3½"

30°

45°

2196

2196

3"DIA.

7 3/8"

1'-9"

3"DIA.

8½"

1"

1"

7"RAD.

2

3 6

14 3/8"

3 5

3 4

3 3

BH, 32

4½"

18

X=6"

4"X6"FR

4"X6"FR.

4"X6"FR

X=6"

SPOOL

3½"

9"

48"

48"

48"

48"

X=6"

4½" DIA
SPOOL

TERM MADE
4½" E TERM

SCALE ¾" = 1'-0"

6

UPPER DECK
STARB'D SIDE BHD 32-FR 36

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NAME OF TRAINEE_____ INSTRUCTOR_____ DATE_____ SCHOOL_____ GRADE_____

Marine Sheet Metal Ventilation

Assignment Sheet, Shop Drawing No. 6

UPPER DECK, STARB'D SIDE BHD 32-FR. 36

DIRECTIONS: Read each question, locate the answer on drawing No. 6 and then record the answer to the right of each question.

QUESTIONS	ANSWERS
1. State the overall length of the long duct.	
2. State the length of rectangular duct under Fr. 33 and 34.	
3. State the length of rectangular duct under Fr. 35 and 36.	
4. State the X dimension of rect. duct mar. Fr. 32.	
5. State the X dimension of rect. duct mar. Fr. 33.	
6. State the X dimension of rect. duct mar. Fr. 34.	
7. State the X dimension of rect. duct mar. Fr. 35.	
8. State the X dimension of rect. duct mar. Fr. 36.	
9. How many collars or "take offs" are on large rect. duct?	
10. What angles do these collars make to rect. duct at Fr. 34?	
11. State the required number of hangers to support 11 x 12½ duct.	
12. State the required number of hangers to support 11 x 11 duct.	
13. State the required number of hangers to support 4½ Terminal line.	
14. State the required number of hangers to support 6″ Terminal line.	

15. List the data required to fabricate the flanges shown on shop drawing No. 6.

	Quantity	Size	Location
a.	1 pr.	11 x 12½ Rect. N.W.T.	No. 2195 Fr. 32
b.			
c.			
d.			
e.			
f.			
g.			
h.			
i.			
j.			

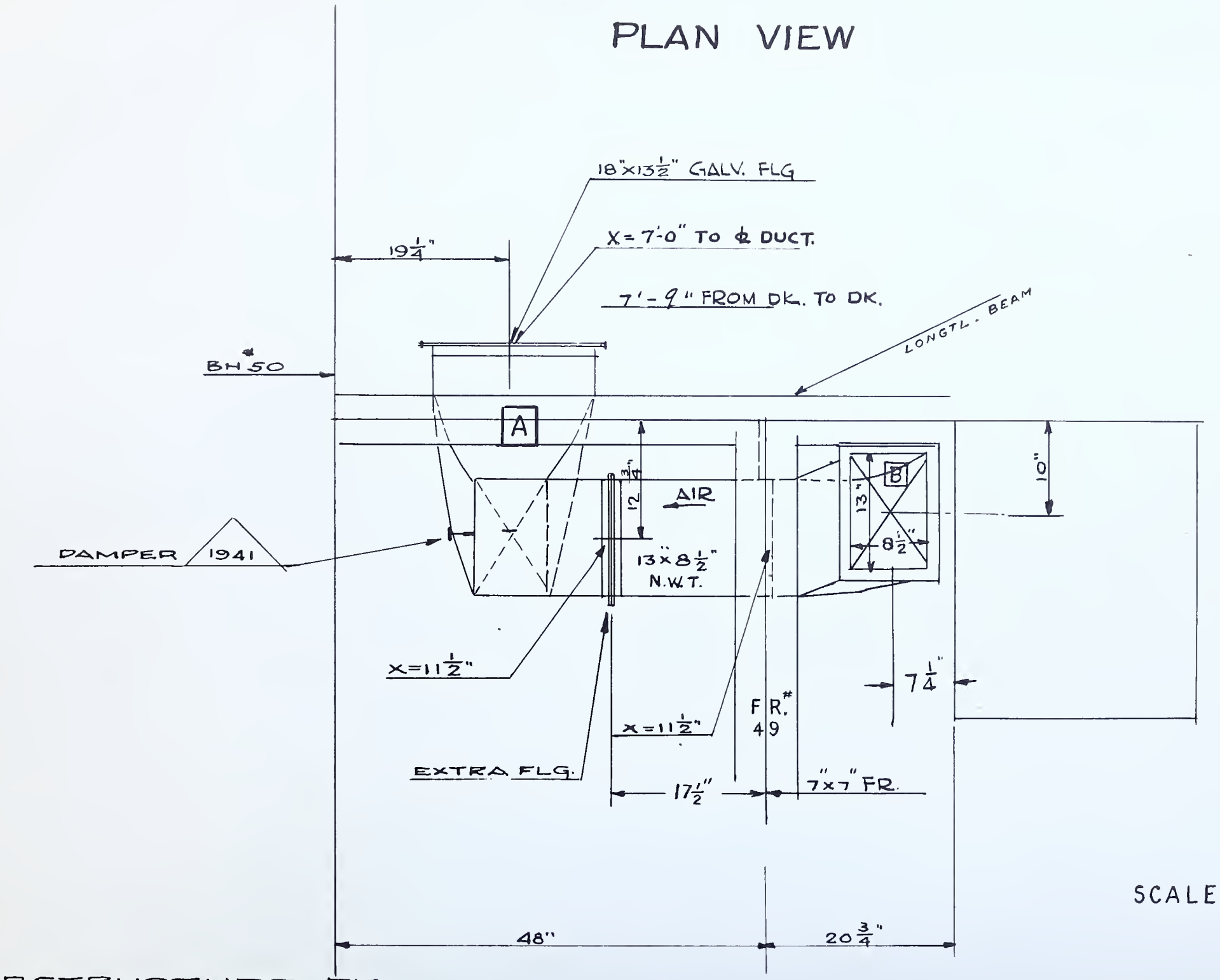
16. List the data for fabricating elbows:

	Quan.	Diam.	Radius	Angles	Straight	Drop	Location
a.	1	6″	6″	90°		0	Fr. 34 at Term.
b.							
c.							
d.							

17. List the data for fabricating collars:

	Quan.	Size	Angle	Location	Remarks
a.	1	2½″ diam.	45°	Fr. 32	3″ length of throat
b.					
c.					
d.					

PLAN VIEW



SCALE ¾"=1'-0'

SUPERSTRUCTURE DK

STARB'D. 48-BH-50.

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NAME OF TRAINEE_____ INSTRUCTOR_____ DATE_____ SCHOOL_____ GRADE_____

Marine Sheet Metal Ventilation

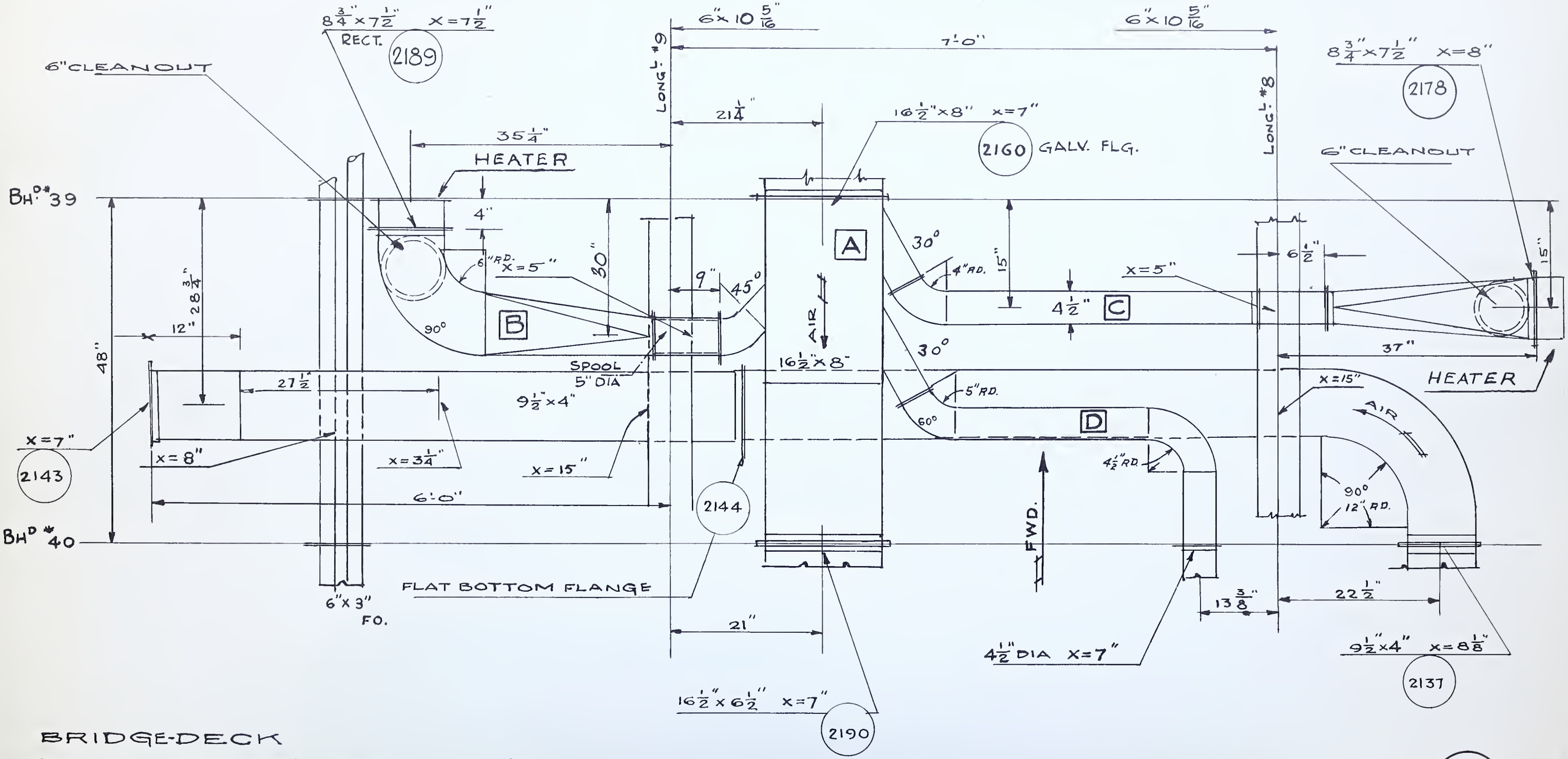
Assignment Sheet, Shop Drawing No. 7

SUPERSTRUCTURE DECK, STARBOARD 48-BHD 50

DIRECTIONS: Read each question, locate the answer on drawing No. 7 and then record the answer to the right of each question.

QUESTIONS	ANSWERS
1. What is the distance from a ℄ of the 18″ x 13½″ galvanized flange to the ℄ of the 13″ x 8½″ flange?	
2. What is the measurement from DK to DK?	
3. What is the "X" measurement of fitting "A"?	
4. What is the size of the duct that contains the damper 1941?	
5. What is the elevation of the extra flange?	
6. State the distance from ℄ of extra flange to ℄ of 13″ x 8½″ fitting.	
7. What is the distance from Bh'd 50 to ℄ of fitting "A"?	
8. What is the distance from ℄ of fitting "A" to ℄ of of the 13″ x 8½″ N.W.T. duct?	
9. What is the direction of air flow?	
10. What are the end sizes of fitting "A"?	
11. What are the end sizes of fitting "B"?	
12. Name fitting "A".	
13. Name fitting "B".	
14. State the number of flanges shown on print.	
15. Give the sizes of all flanges. (Make an elevation sketch of the layout looking for'd.)	

NOTES



BRIDGE-DECK
PORT STARB'D BHD 39-40
PASSAGE
TO BE MADE OF BRASS

SCALE 3/4" = 1'-0"

8

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NAME OF TRAINEE_____ INSTRUCTOR_____ DATE_____ SCHOOL_____ GRADE_____

Marine Sheet Metal Ventilation

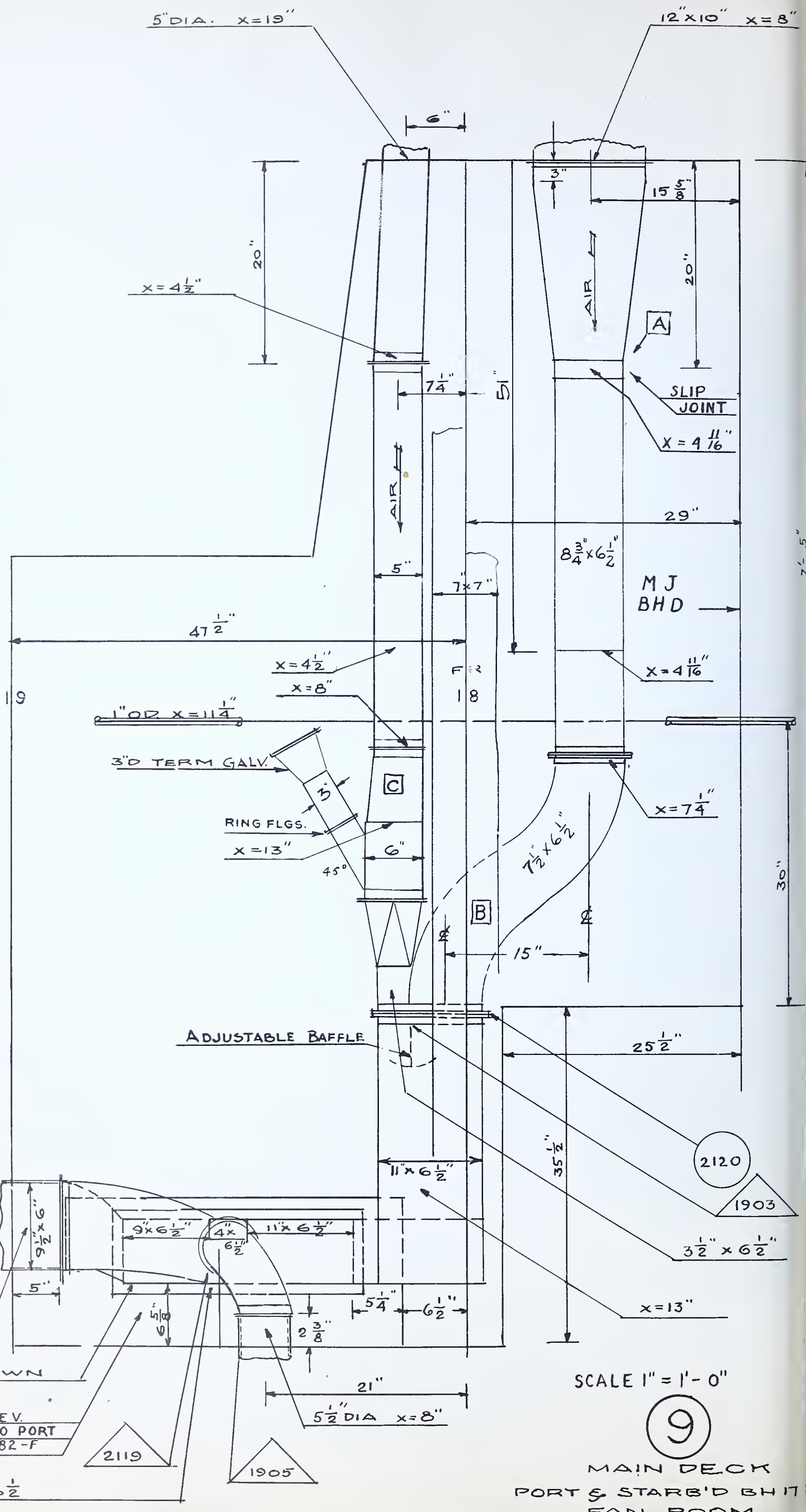
Assignment Sheet, Shop Drawing No. 8

BRIDGE DECK, PORT STARBOARD BHD 39-40, PASSAGE, TO BE MADE OF BRASS

DIRECTIONS: Read each question, locate the answer on drawing No. 8 and then record the answer to the right of each question.

QUESTIONS	ANSWERS
1. What is the scale of the drawing?	
2. What Bh'ds are included in this layout?	
3. State the distance from Bh'd 39 to 9⅛″ x 4″ duct.	
4. State the "X" dimension of 9½″ x 4″ duct at flange 2143.	
5. State the "X" dimension of 9½″ x 4″ duct at the No. 8 longitudinal.	
6. State the "X" dimension of 9½″ x 4″ duct at Bh'd 40.	
7. State the "X" dimension of 9½″ x 4″ duct at long. 9.	
8. State the "X" dimension of flange 2137.	
9. State the length of 9½″ x 4″ duct from flange 2143 to ℄ of elbow.	
10. What is the distance between bottom of section "A" and top of 9½″ x 4″ duct?	
11. What angle does the collar for section "B" make with 16⅛″ x 8″ duct "A"?	
12. What is the "X" dimension of 5″ diameter spool?	
13. State distance from ℄ of 5″ diameter spool to Bh'd 39.	

QUESTIONS	ANSWERS
14. What are the end dimensions of transition "B"?	
15. Specify the size of 90° elbow on section "B".	
16. State the heater dimensions at flange 2189.	
17. What angle does the collar for section "C" make with "A"?	
18. Specify the size of elbow in section "C".	
19. Does the duct "C" go under or through long. 8?	
20. State the end dimensions of transition piece in duct "C".	
21. What is the "X" dimension of heater at flange 2178?	
22. What is the "X" dimension of collar on section "D"?	
23. Specify the size of the 60° elbow on section "D".	
24. Specify the size of the 90° elbow on section "D".	
25. State the number of elbows shown on drawing.	
26. Make an elevation sketch of this layout.	



SCALE 1" = 1'-0"

9

MAIN DECK

PORT & STARB'D BH 17 FAN ROOM.

NAME OF TRAINEE_____ INSTRUCTOR_____

DATE_____ SCHOOL_____ GRADE_____

Marine Sheet Metal Ventilation — Assignment Sheet, Shop Drawing No. 9

MAIN DECK
PORT AND STARB'D BHD 17-19
FAN ROOM

DIRECTIONS: Read each question, locate the answer on drawing No. 9 and then record the answer to the right of each question.

QUESTIONS	ANSWERS
1. State the scale of drawing No. 9.	
2. State the size of the terminal.	
3. What is the item number of the flange near adjustable baffle?	
4. State the size of the duct at flange 2120 which contains baffle.	
5. What is the "X" measurement of the flange 2120?	
6. What is the elevation of the duct "B"?	
7. State the distance from ℄ to ℄ between Fr. 18 and 19.	
8. State the direction of air flow.	
9. State the distance from M.J. Bh'd. to ℄ of Fr. 18.	
10. State the distance from M.J. Bh'd to ℄ of 12″ x 10″ flange.	
11. State the offset distance O.G. fitting duct 7½ x 6½.	
12. State the ℄ to ℄ distance between 5″ diameter duct and Fr. 18.	
13. State the elevation of 5″ diameter duct at intake.	
14. State the elevation of the 6″ diameter duct connecting terminal.	
15. What type of ventilation is shown?	
16. What is the rise of O.G. fitting?	
17. What is the size of Fr. 18?	

NOTES

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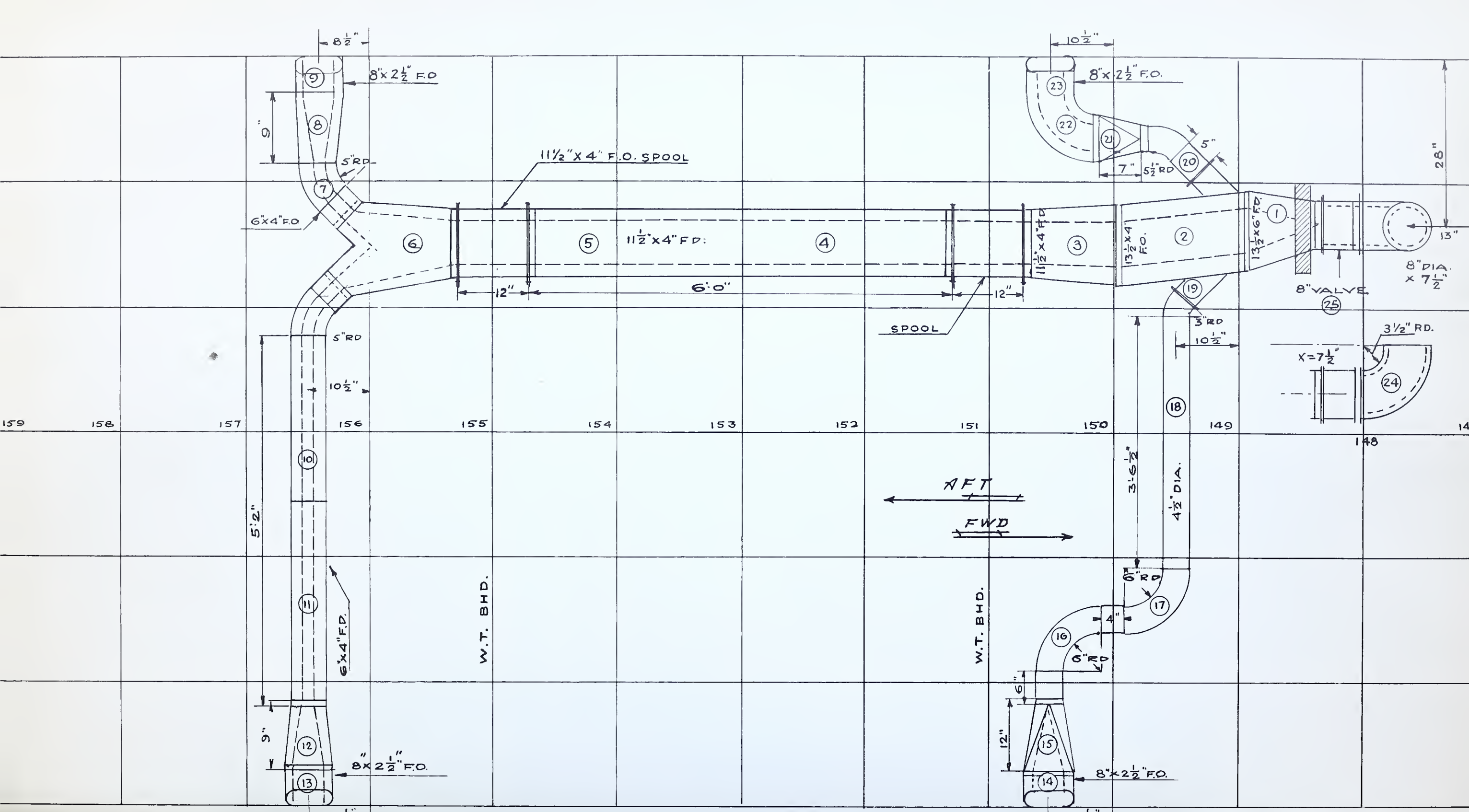

SUPPLY SYSTEM IN 5" POWDER MAG. C.

10

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NAME OF TRAINEE_____ INSTRUCTOR_____ DATE_____ SCHOOL_____ GRADE_____

Marine Sheet Metal Ventilation

Assignment Sheet, Shop Drawing No. 10

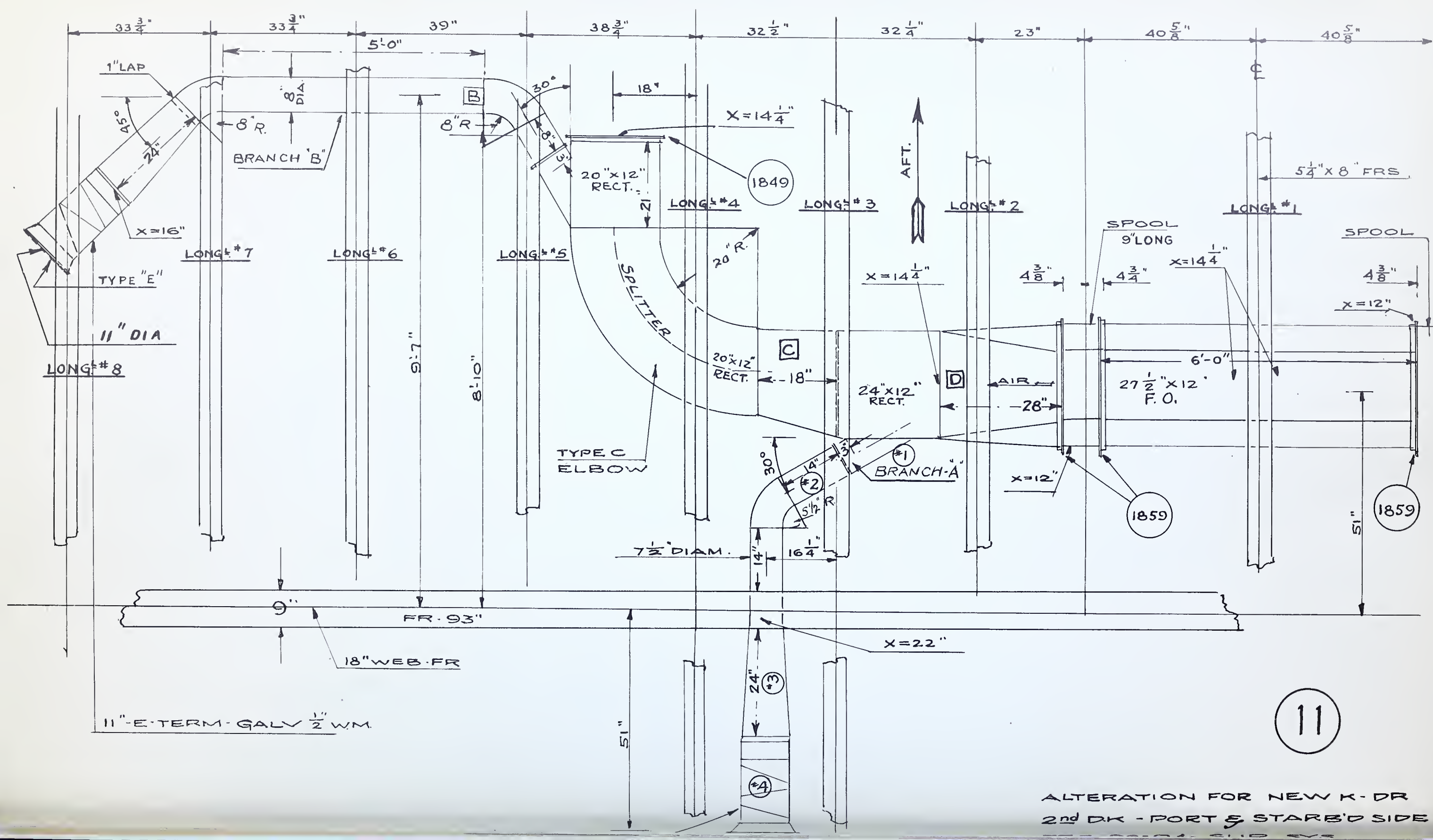
SUPPLY SYSTEM IN 5" POWDER MAG. C

DIRECTIONS: Read Drawing No. 10 and list in column A the name of items shown on drawing; Column B the end sizes of each item; Column C the location of each item. See Item No. 1 as an example.

ITEM	A — NAME OF ITEM	B — END SIZES	C — LOCATION
1.	Transition	13½ x 6 F.O. to 8" dia.	Frs. 148-149
2.			
3.			
4 & 5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			

ITEM	A — NAME OF ITEM	B — END SIZES	C — LOCATION
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			

NOTES



11

ALTERATION FOR NEW K-DR
2nd DK - PORT & STARB'D SIDE

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NAME OF TRAINEE_____ INSTRUCTOR_____ DATE_____ SCHOOL_____ GRADE_____

Marine Sheet Metal Ventilation

Assignment Sheet, Shop Drawing No. 11

ALTERATION FOR NEW K-DR 2ND DK—PORT AND STARB'D SIDE FRS. 90-94—SUP. SYS.

DIRECTIONS: Listed below are some of the fittings shown on drawing No. 11, and dimensions required to fabricate each fitting. Read the drawing to obtain the necessary fabrication dimensions and then record findings in the spaces provided on this sheet.

1. Type C Elbow

Size at flange end .... _____ Size at opposite end _____

"X" dimension ..... _____ "X" dimension .... _____

Length of Straight ... _____ Throat radius ..... _____

Location ..... _____ Splitter radius .... _____

2. Fitting No. C

Size at elbow end ... _____ Size at opposite end _____

"X" dimension ..... _____ "X" dimension .... _____

Length ..... _____ Straight on ..... _____

Location ..... _____ side _____

3. Transformer No. D

Size at flange end .... _____ Size at opposite end _____

"X" dimension ..... _____ "X" dimension .... _____

Length of transformer _____ Length of straight.. _____

Offset ..... _____ Location ..... _____

4. Spool

Size of spool ..... _____ Length ..... _____

"X" dimension ..... _____ Location ..... _____

5. Straight F.O. Duct

Size of spool end .... _____ Size at opposite end _____

Length ..... _____ Location ..... _____

6. Branch "A" Collar No. 1

Size ..... _____ Length of throat ... _____

Angle ..... _____ Location ..... _____

7. Branch "A" Elbow No. 2

Size ..... _____ Length of straight.. _____

Angle ..... _____ Location ..... _____

Radius ..... _____

8. Branch "A" Reducer No. 3

Size at elbow end .... _____ Size at terminal ... _____

"X" dimension ..... _____ "X" dimension .... _____

Size at Fr. 93 ..... _____ Location ..... _____

9. Branch A—Terminal

Size at terminal ..... _____ Location ..... _____

"X" dimension ..... _____ Type of terminal .. _____

10. Branch B—Collar

Size of collar ..... _____ Length of throat ... _____

"X" dimension .... _____ Angle ..... _____

11. Branch B—Elbow at Collar

Size ..... _____ Length of straight.. _____

Angle ..... _____ Location ..... _____

Radius ..... _____

12. Branch B—Duct

Size ..... _____ Location ..... _____

"X" dimension .... _____ Length ..... _____

13. Branch B—Elbow (at Terminal End)

Size ..... _____ Length of straight.. _____

Angle ..... _____ Location ..... _____

Radius ..... _____

14. Branch B—Reducer

Size at elbow end .. _____ Size at terminal end _____

"X" dimension .... _____ "X" dimension .... _____

Length ..... _____ Location ..... _____

$4\frac{1}{2}$" E. TERM. . N.P.

24"

BRANCH C

$X=4\frac{1}{4}$"

3"DIA.

2222

8"RD.

9"

11"X6" RECT. D

X=6"

24"

X=6"

42"

$3\frac{1}{2}$"DIAM

44

45

46

47

48

48"

48"

48"

4"X6"FR

4"X6"FR

FR. 48

4"X12"FR.

9"

X=4"

SPLIT $5\frac{3}{4}$"X10

SPLITTER

18"

X=16"

11"X10" RECT.

$5\frac{3}{4}$"

$5\frac{1}{2}$"

5" R.

12"

18"

3037

AIR

X=16"

9"

24"

3037

18"

9"

SPLIT $5\frac{3}{4}$"X10

UPPER SPOOL X=5

9"

2242

3054

21"

28"

10" RD.

A

90°

LOWER SPOOL

12" DIA.

$X=9\frac{1}{2}$"

$23\frac{3}{4}$" X 10" INSIDE RECT.

$X=11\frac{1}{2}$"

DETAIL

28"

6"

$10\frac{1}{2}$"

HEATER

5"

6"X8"ACCESS HOLE

12"X5" RECT.

$X=10\frac{1}{2}$"

3"

BH 44

4"X6"FR

48"

RECT. SPOOL WELDED SEAM

SCALE $\frac{3}{4}$" = 1'-0"

12

UPPER DECK
STARB'D SIDE

CUT HERE TO REMOVE SHEET

NAME OF TRAINEE_____ INSTRUCTOR_____ DATE_____ SCHOOL_____ GRADE_____

Marine Sheet Metal Ventilation **Assignment Sheet, Shop Drawing No. 12**

UPPER DECK STARB'D SIDE PASSAGE

DIRECTIONS: Read each question, locate the answer on drawing No. 12 and then record the answer in space provided on this sheet.

1. What are the dimensions of the heater?
   a. Size (flg. 2242) ..... 23¾" x 10" X dimension_____
   b. Length of heater ..... 5" Location ..._____

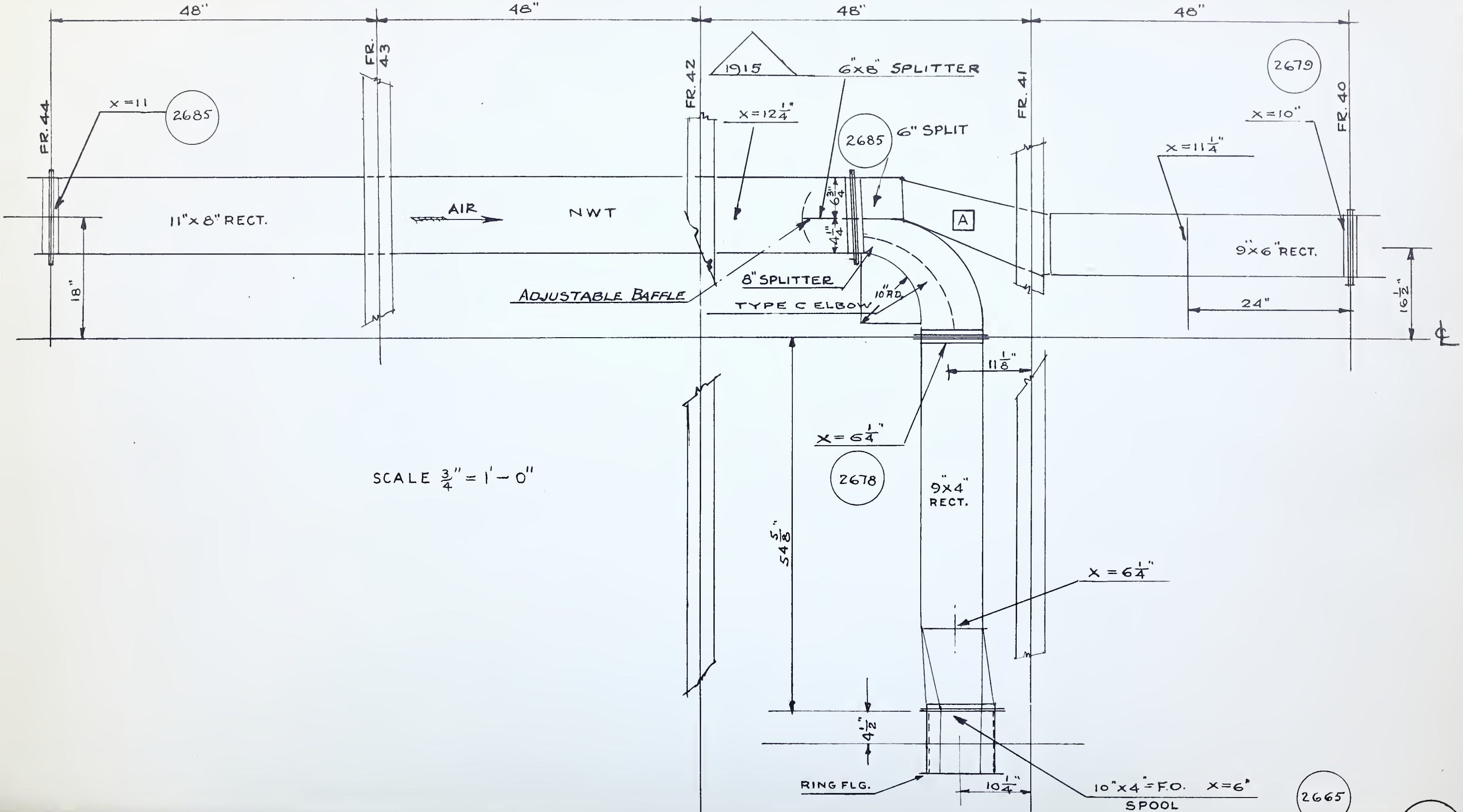
2. What are the dimensions of Transition fitting from heater to item "A"?
   a. Size at flange end ..... X dimension_____
   b. Size at elbow end ..... X dimension_____
   c. Size of access hole ..... 6 x 8 Location ..._____

3. What are the dimensions of Elbow "A"?
   a. Size at flg. end ..... X dimension_____
   b. Size at Fr. 45 ..... X dimension_____
   c. Throat radius ..... Angle ....._____
   d. Location .....

4. What are the dimensions of Fitting "B"?
   a. Size at spool end ..... X dimension_____
   b. Size at flg. end 3037 ..... X dimension_____
   c. Length of straight (spool end)_____
   d. Length of straight (flange end)_____
   e. Radius of throat ..... Angle ....._____
   f. Size of Splitter ..... Location ..._____
   g. Size at flg. 2222 end ..... X dimension_____
   h. Length of straight near Fr. 44_____
   i. Diameter of collar ..... Location ..._____

5. What are the dimensions for straight duct?
   a. Size of duct ..... X dimension_____
   b. Length of duct ..... Drop ....._____
   c. Location .....

NOTES



SCALE $\frac{3}{4}$" = 1'-0"

SUPERSTRUCTURE DK
FR 40-44

13

CUT HERE TO REMOVE SHEET

NAME OF TRAINEE_____ INSTRUCTOR_____ DATE_____ SCHOOL_____ GRADE_____

Marine Sheet Metal Ventilation

Assignment Sheet, Shop Drawing No. 13

SUPERSTRUCTURE DECK, STARBOARD — FR. 40-44

DIRECTIONS: Read each question, locate the answer on drawing No. 13 and then record the answer to the right of each question.

QUESTIONS	ANSWERS
1. What is the location of this job?	
2. State the dimensions of flange 2665.	
3. What is the distance from ℄ to ℄ between flange 2265 and Fr. 41?	
4. State the length from flange to flange of the 9 x 4 duct.	
5. State the distance from ℄ to ℄ flange 2678 and frame 41.	
6. What is the throat radius of the type "C" elbow?	
7. State the elevation of flange 2679.	
8. State the length of the 11 x 8 N.W.T. duct.	
9. State the drop in 11 x 8 N.W.T. duct.	
10. How many flanges are shown in this detail?	
11. What type baffle is installed at the branch?	
12. What size splitter is specified in type "C" elbow?	
13. What is the drop in the type "C" elbow?	
14. What is the rise in the "A" fitting?	
15. How many spools are shown?	
16. What is the dimension of the fitting that connects the duct to flange 2665?	
17. State distance from ℄ of ship to ℄ of spool.	

NOTES

SUPERSTRUCTURE D.K.
STARBOARD

X=14½"
11¾"
24"
48"
48"
48"
2696
19½"x8"
5"x8" SPLIT
14½"x8" SPLIT
6"
FR. 52
32"
A
X=11¾"
51
1½"x8" SPLITTER
1913
1'-4½"
1'-3"
50
2"O.D. X=9"
49
1915
PLITTER
6X8
ADJ
BAFFLE
15"
20¾"
ADD BAFFLE
19½"x8"
1" LAP
1'-9¾"
7½"
15½"x8"
RECT.
2671
23½"
7"
X=7½"
1½" SPLIT
12" RD.
SPLITTER
11"
3¾"
6" RD.
D
7"
10½" SPLIT
AIR
4¾"
X=11¼"
2685
X=11"
11"x8"
RECT.
6'-6"
X=11¾"
B
TYPE C ELBOW
15"
18¾"
3½" SPLIT
10" RD.
C
X'=11¼"
2685
2675
2692
16½"
8"x6" X=7¾"
18⅞"
SCALE ¾"=1'-0"

NAME OF TRAINEE_____ INSTRUCTOR_____ DATE_____ SCHOOL_____ GRADE_____

Marine Sheet Metal Ventilation

Assignment Sheet, Shop Drawing No. 14

SUPERSTRUCTURE DK—STARBOARD

DIRECTIONS: Read each question, locate the answer on drawing No. 14 and then record the answer to the right of each question.

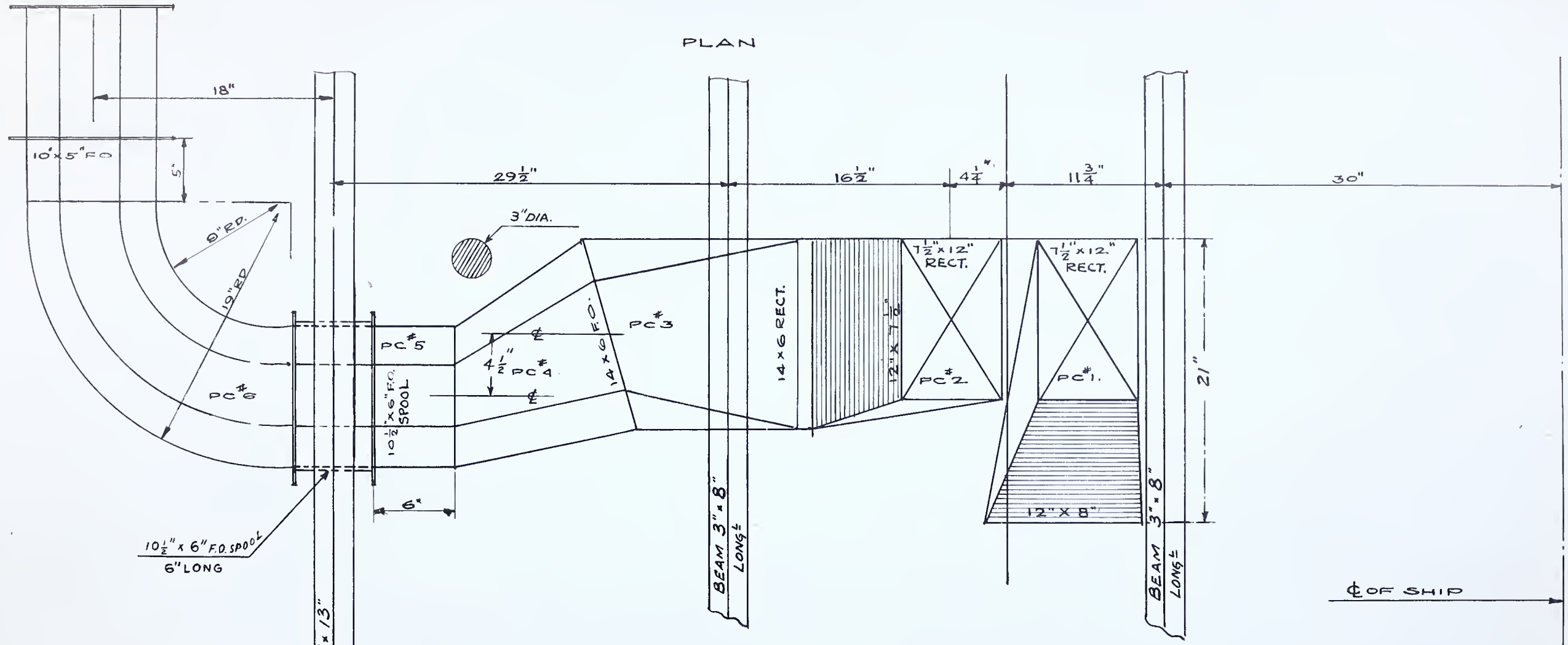
QUESTIONS ANSWERS

1. Give the direction of air flow. ..... _____
2. What is item 2671? ..... _____
3. Give ℄ to ℄ measurement of item 2696 to Fr. 51. ..... _____
4. Give ℄ to ℄ measurement of item 2673 to Fr. 51. ..... _____
5. Give dimension from Fr. 50 to ℄ of diffusing terminal. ..... _____
6. What is the difference in "X" dimensions between item 2672 and item 2692? ..... _____
7. What is the difference in "X" dimensions between item 2675 and item 2696? ..... _____
8. What is the rise dimension in fitting "A"? ..... _____
9. What is the dimension of item 2685 at Fr. 48 to ℄ of item 2696? ..... _____
10. Give the difference in "X" measurement in fitting "B". ..... _____
11. What type duct is shown on this sketch? ..... _____
12. Give location of duct on this sketch. _____
13. Give sizes of split fitting 11″ forward of Fr. 51. ..... _____
14. Give sizes of split fitting between Fr. 51 and Fr. 52. ..... _____
15. List the number and sizes of flanges required on this sketch.

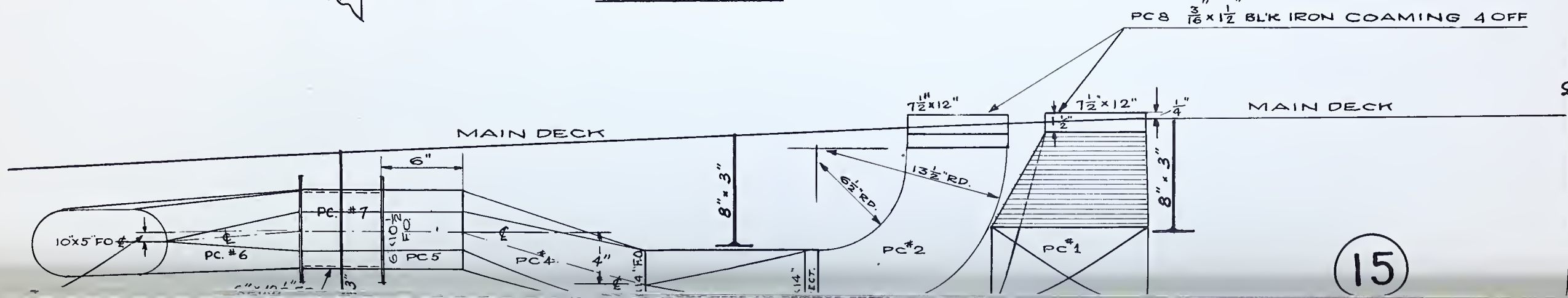
Item	Number	Size
2696	_____	_____
2692	_____	_____
2675	_____	_____
2672	_____	_____
2685	_____	_____

16. What are the dimensions of fitting "A"?
    a. Size at flange end .. _____ "X" dimension ... _____
    b. Size at opposite end _____ "X" dimension ... _____
    c. Offset ..... _____ Direction of offset _____
    d. Length of Ogee ... _____
17. What are the dimensions of fitting "B"?
    a. Size at flange end .. _____ "X" dimension . _____
    b. Size at opposite end _____ "X" dimension . _____
    c. Length of duct .... _____ Location ..... _____
18. What are the dimensions of rect. transformer connecting "B" and "A"?
    a. Size at "B" fitting .... _____ "X" dimension ..... _____
    b. Size at "A" fitting ..... _____ "X" dimension ..... _____
    c. Length of transformer _____ Location of straight side. _____
19. What are the dimensions for type C elbow?
    a. Size at flange end . _____ "X" dimension ... _____
    b. Size at "A" fitting _____ "X" dimension .. _____
    c. Radius of throat . _____ Angle ..... _____
    d. Length of straight at "B" fitting ..... _____ Length of straight of flange ..... _____
    e. Location of splitter_____ Size of splitter ... _____
20. What are the dimensions for split fitting elbow C?
    a. Size at flange 2692 . _____ "X" dimension _____
    b. Size of flange 2672 . _____ "X" dimension . _____
    c. Radius of throat ... _____ Angle ..... _____
    d. Length of straight . _____
21. What are the dimensions for fitting D?
    a. Size at flange 2692 _____ "X" dimension _____
    b. Size at lap end .... _____ "X" dimension . _____
    c. Radius of throat ... _____
    d. Length of straight . _____

PLAN



CREWS QUARTERS - 1ST PLATFORM
AT FRAME 161 - PORT SIDE
SCALE 1½" = 1'-0"



NAME OF TRAINEE_____ INSTRUCTOR_____ DATE_____ SCHOOL_____ GRADE_____

Marine Sheet Metal Ventilation

Assignment Sheet, Shop Drawing No. 15

CREW'S QUARTERS 1st PLATFORM AT FRS. 161-163 PORT SIDE

DIRECTIONS: Read each question, locate the answer on drawing No. 15 and then record the answer to the right of each question.

QUESTIONS	ANSWERS
1. State the location of this detail.	
2. What is the scale of this drawing?	
3. State distance from ℄ of ship to ℄ of piece 2.	
4. State the dimensions of piece 2 at main deck.	
5. State the dimensions of piece 2 where it joins piece 3.	
6. State the throat radius of piece 2.	
7. State the outside of radius of piece 2.	
8. State the offset distance between piece 3 and 5.	
9. State the size of the spool.	
10. State the throat radius of piece 6.	
11. State the outside radius of piece 6.	
12. State the distance from ℄ to ℄ from 10 x 5 F.O. flange to beam.	
13. What is the drop in piece 6?	
14. State the distance from center of spool to Fr. 161.	
15. What is the throat measurement for piece 1?	
16. Into what shapes does piece 3 transform?	
17. State the distance the spool extends aft the Fr. 163.	
18. What is the length of the spool?	
19. What is the "X" measurement of piece 3?	
20. What is the "X" measurement of spool?	
21. What type of system is this?	
22. What type of fitting is piece 1?	
23. What type of fitting is piece 2?	
24. What type of fitting is piece 3?	
25. What type of fitting is piece 4?	
26. What type of fitting is piece 6?	

BILL OF MATERIAL

Type of ventilation N.W.T., all spools to be W.T., with flange to connect to adjoining sections with W.T. to N.W.T. flanges. Runs of pipe are to be riveted unless otherwise specified.

	TYPE OR DESCRIPTION	LOCATION CREWS QTRS.—1st PLATFORM	SIZES	THROAT RADIUS
Piece No. 1				
Piece No. 2				
Piece No. 3				
Piece No. 4				
Piece No. 5				
Piece No. 6				
Piece No. 7				